

Monitoring and Controls (MCS)

Dave Ambrose

Ace Training

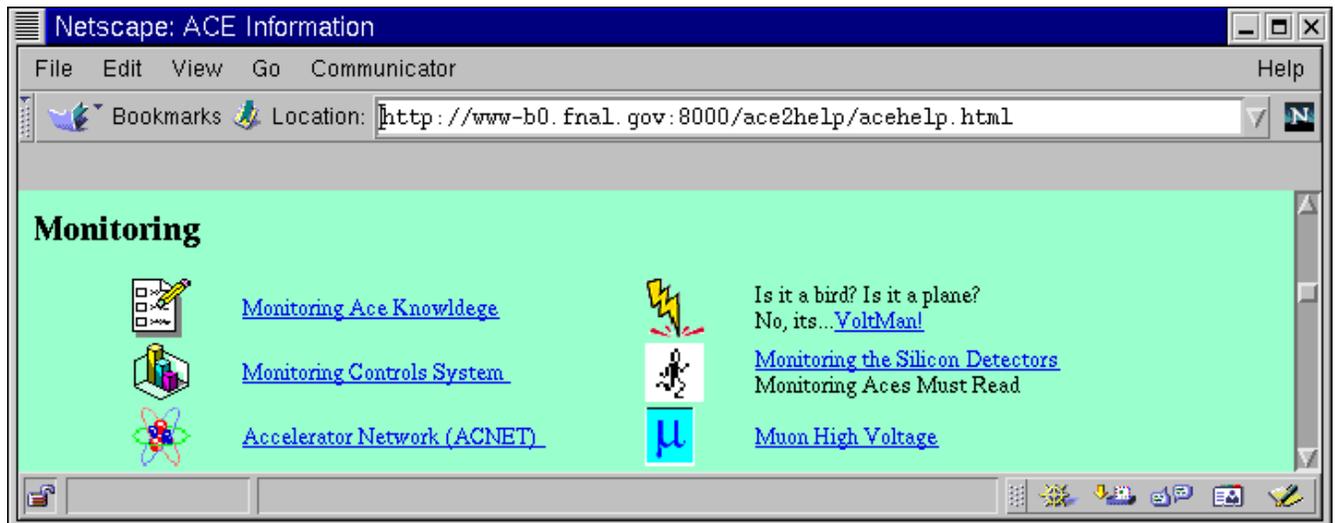
March 27, 2002

- information resources
- control room layout
- *iFIX* overview
- basic *iFIX* operation
- monitoring shift responsibilities



MCS: Information Resources

- Monitoring section of “Ace Page”



- “Monitoring Ace Knowledge”
 - needs updating badly, but...
 - contains links to CDF Run I/II Safety Procedures
 - lists current system problems
 - summarizes monitoring shift responsibilities, things to look out for (alarms, status boards, etc.)
 - describes VESDA and FIRUS systems
 - gives allowed values or ranges of important parameters in the system *iFIX* pages

MCS: Information Resources

(continued)

- “Monitoring and Control Systems” documentation page
 - links to MCS homepage and tutorials
 - online displays of *iFIX* pages
 - documentation for each detector sub-system, including:
 - * tutorials
 - * shift instructions
 - * recovery procedures

The screenshot shows a Netscape browser window with the following content:

Netscape: CDF Hardware Monitoring Documentation and Recovery procedures

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://www-b0.fnal.gov:8000/mcs/mondoc.html>

<i>CDF iFix Slow</i>	<i>Controls (MCS)</i>	<i>ACNET -Beam</i>	<i>Utilities + Safety</i>	<i>DAQ, Misc</i>
Tutorial - Homepage Instructions to Shift Recovery Procedure	Web-Server Pics Access Security	Tutorial Shot Setup -RadMon	Monitoring Ace Page	DAQ Ace info Operations page

Legend : **READY** , Preliminary , Not yet available

In case of problems with systems that do not yet have recovery procedure available, Please click here for [Expert call-in phone lists](#).

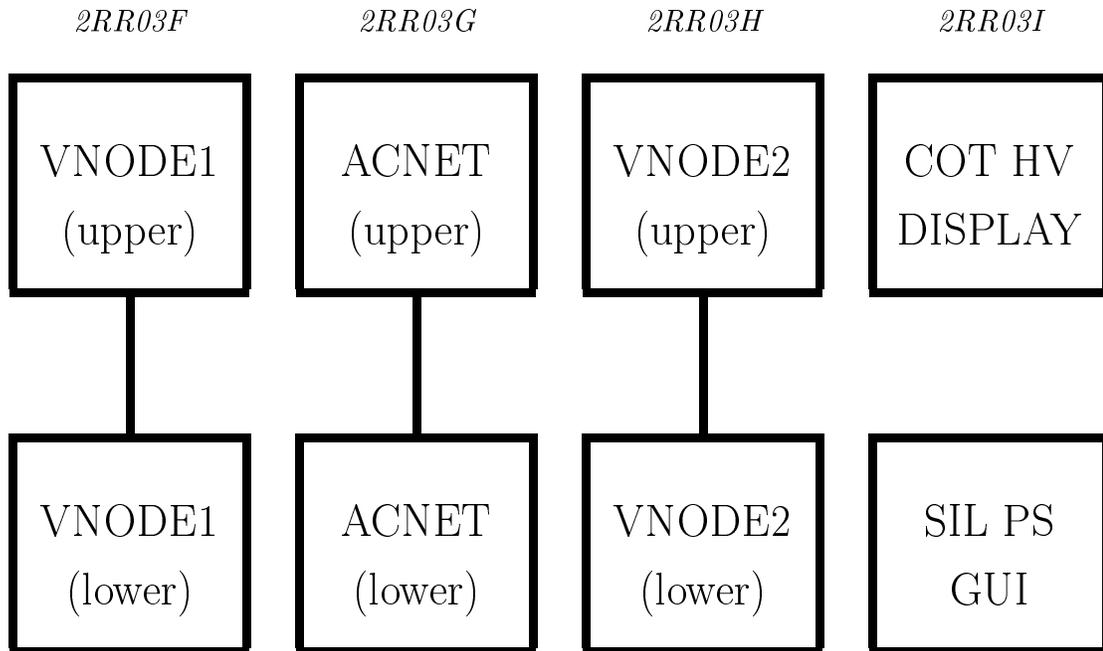
<i>COT HV</i>	<i>MUONS - HV</i>	<i>CES-CCR-CPR</i>	<i>CEM,C/MHA,GAM</i>	<i>Trigger Inhibit</i>
Instructions to Shift	Instructions to Shift Trip Recovery	Intruction to Shift	Tutorial Instructions to Shift Recovery Procedure	Design Notes

<i>SVX,ISL,L00</i>	<i>CSX, CSP</i>	<i>TOF</i>	<i>PEM - PHA - PSH</i>	<i>xxx</i>
Instructions to Shift Radiation Mon Cooling Mon Bias Voltage		Shift Instructions	Not Available	Not Available

<i>xxx</i>	<i>TRU cot util</i>	<i>CLC</i>	<i>PTM plug temp</i>	<i>PSM power sup</i>
Not Available	Not Available	Instructions to Shift	Instruction, Recover	See the Alarm Help Section on the VoltMan page for PSM trips.

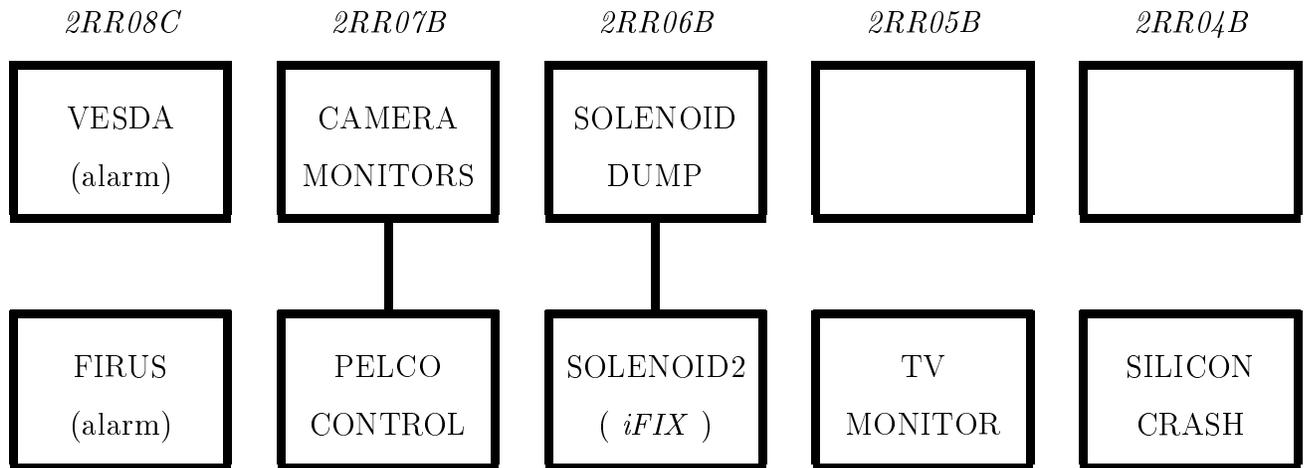
<i>PC BACKUP</i>	<i>xxx</i>	<i>Template</i>	<i>xxx</i>	<i>xxx</i>
Procedure What items Other Info	Not Available	Tutorial Instructions to Shift Recovery Procedure	Not Available	

MCS: Control Room (West)



- VNODE1: (*iFIX* node)
 - for global summary pages, voice alarms
- ACNET: (ACcelerator NET)
 - accelerator monitoring (beam current, luminosity, losses)
- VNODE2: (*iFIX* node)
 - for general monitoring use
- COT HV DISPLAY: (read only)
 - displays HV/current for 25 wires of superlayer
 - “Trip Log” records ramping and SL/wire info of trips
- SIL PS GUI: (expert only)
 - Silicon power supply monitoring/control

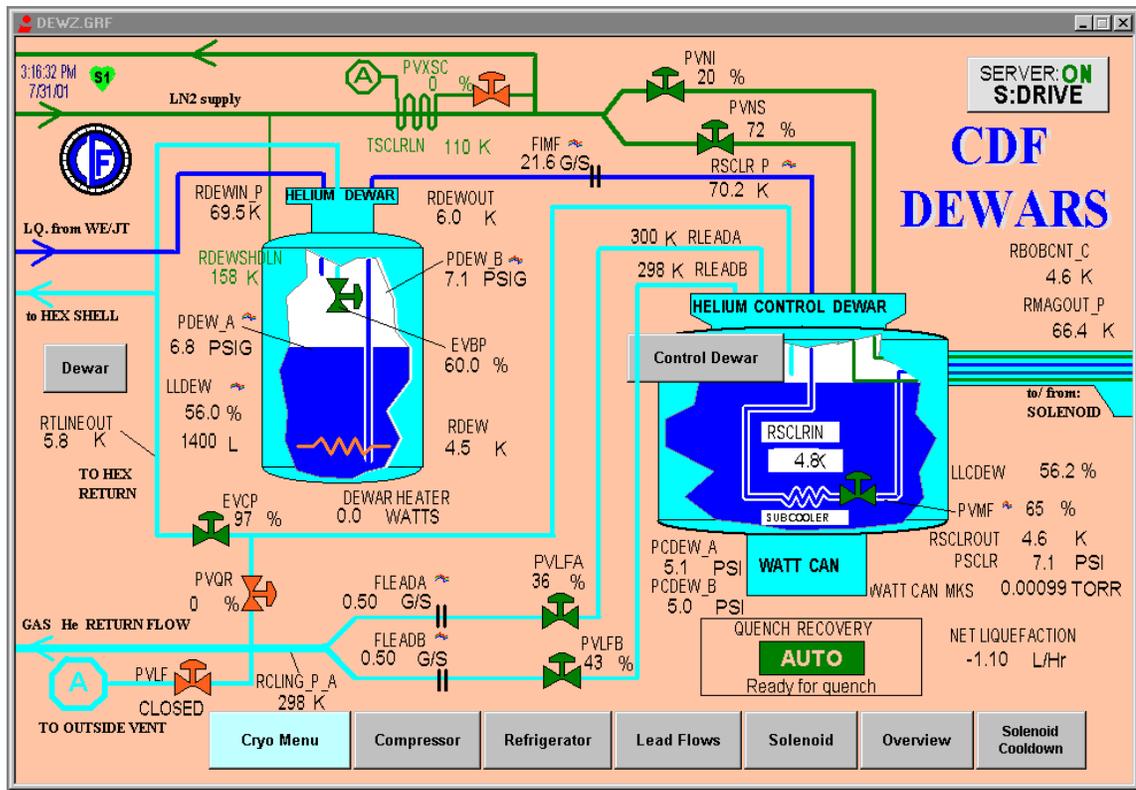
MCS: Control Room (South)



- VESDA: (collision hall smoke detector)
 - may show 0.1-0.2 during accesses
 - 0.4/0.7 generates FIRUS TROUBLE/EMERGENCY
- FIRUS: (fire alarm system display)
 - TROUBLE warns of pre-alarm condition
 - EMERGENCY describes real alarm, follow ERP
- SOLENOID CRASH:
 - indicators, crash buttons for slow/fast dump
- SOLENOID2: (*iFIX* node)
 - dedicated node for magnet control/monitoring
- SILICON CRASH:
 - cooling (expert only) and rack power crash buttons

MCS: *iFIX* Overview

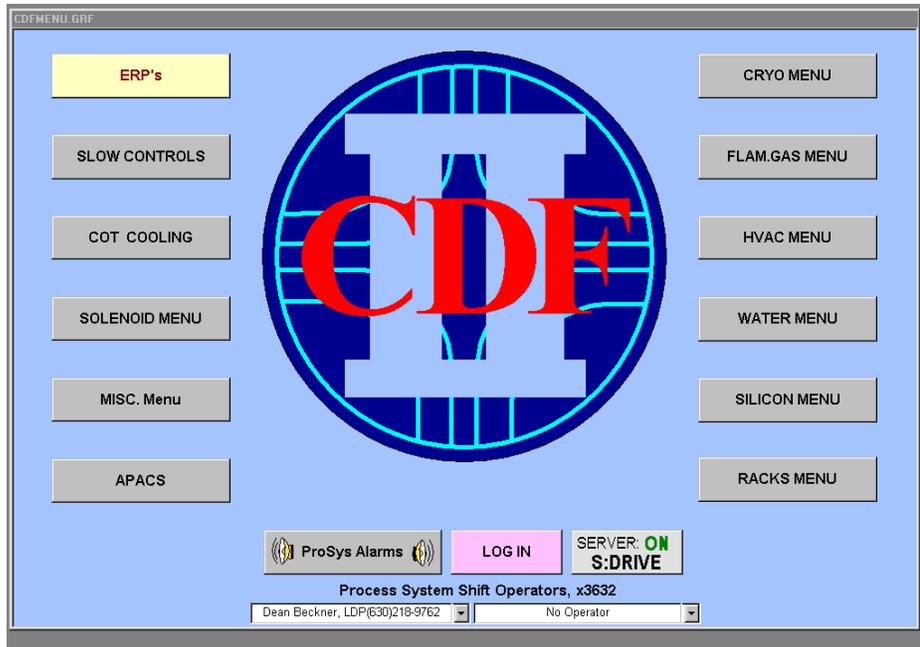
- *iFIX* (Fully Integrated Control System, by “Intellution”):
 - allows PC to control/monitor equipment with GUI’s
 - CDF system uses 15 nodes (PC’s), including:
 - * VNODE1 - summary pages
 - * VNODE2 - general use
 - * SOLENOID2 - magnet monitoring
- *iFIX* allows people on shift to:
 - monitor detector and support systems
 - perform basic (non-expert) control during data taking
 - alert experts when exceptions occur
- example *iFIX* page (from *CRYO MENU*):



MCS: *iFIX* Overview

(continued)

- *iFIX* pages have *web*-like structure of sub-menus and pages all pointing to *MAIN* menu:



link icons



- shows cryo tech on shift ($\times 3632$)
- displays *iFIX* status:
 - * *SERVER* should be *ON*
 - * *DRIVE* should be *S* (main cryo PC), as opposed to *C* (for local PC drive)
- can restart *iFIX* from “Start” menu:
 - Start / Programs / *iFIX* / Int. Dyn. WorkSpace
- log on with two possible accounts:
 - * *PUBLIC* (no password) for general monitoring
 - * *ACE* (see J.C.Yun) for resetting HV, etc.

MCS: Basic *iFIX* Operation

(continued)

- *GLOBAL ALARMS* summarizes the status of detector and power supply systems, showing for each system:
 - matrix of monitored values, warnings, alarms, and ignored quantities
 - link to error history display (large button, e.g. *COT*); green if OK, red for alarm
 - link to detector controls (*D*)
 - status of *iFIX* node, or heartbeat (*H*)

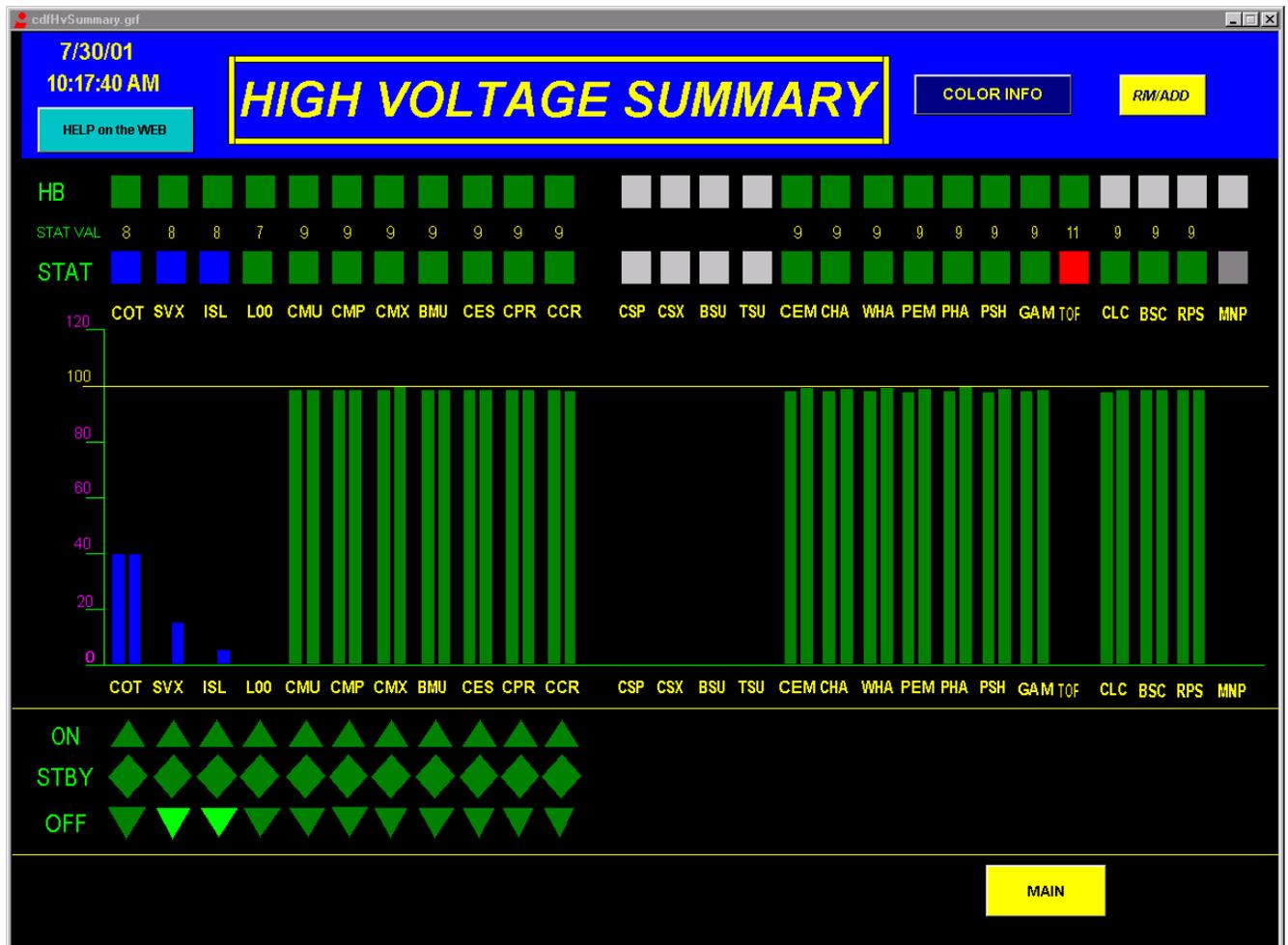
The screenshot displays the 'cdfGblAlarms.grf' application window. At the top left, the time is 7:30:01 and 10:08:29 AM. The 'VOICE ALARM' status is 'ON'. A legend defines symbols: vVar (yellow), Cur (black), Alarmed (black), Ignored (black), Alr (yellow), and Cur (black). Node and HB status are shown as long strings of 0s and 1s. A large 'GLOBAL ALARMS' title is centered. Buttons for 'Main' and 'RM/ADD' are on the right. The main area contains a grid of system cards, each with a title, a 'D' (Detector) or 'H' (Heartbeat) status indicator, and a 2x3 matrix of numerical values.

System	Control	Value 1	Value 2	Value 3
COT	D	0	0.00	0
CMU	D	0	56	0.00
CSP	D			
CLC	D	0	0	0
CES	D	0	9	0
CEM	D	4	0	4
PEM	D	0.00	0	0
SVX	D	0	78	0
CMP	n	0	40	0
CSX	n			
BSC	n	0	0	0
CPR	n	0	16	0
CHA	n	1	0	1
PHA	n	0	0	0
ISL	D	0	86	0
CMX	D	0	56	0
TSU	D			
RPS	D	0	0	0
CCR	D	0	2	0
WHA	D	4	0	4
PSH	D	0	0	0
L00	n	0	18	0
BMU	n	0	72	0
BSU	n			
MNP	D			
PSM	n	0	214	0
GAM	n	0	0	0
PTM	n	0	0	0
TOF	D	0	432	0
	H	432	432	0

MCS: Basic *iFIX* Operation

(continued)

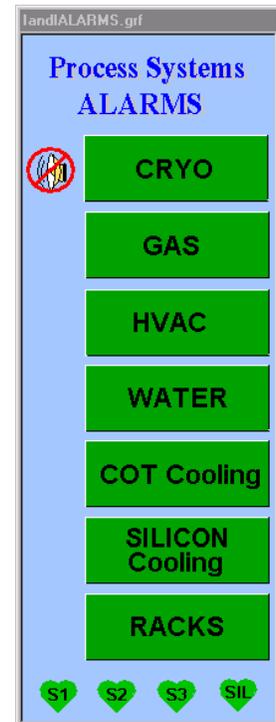
- *HV SUMMARY* displays the high voltage status of each detector, and allows for control of specific systems:
 - *HB* row shows heartbeat status (green is OK, purple is bad)
 - *STAT* gives status condition (green is OK, blue is STANDBY, red is TRIP)
 - double-bar histogram shows percentage HV for minimum and maximum out-of-range signals
 - “arrow” controls turn HV on, off, or to standby



MCS: Basic *iFIX* Operation

(continued)

- *Process System ALARMS* summarizes the status of detector support systems:
 - global button for each subsystem (green is OK, red is ALARM)
 - indicator left of global button signifies that alarm is silenced
 - heartbeat indicators for four cryo area *iFIX* nodes (blinking)
- if there is an alarm:
 - call cryo tech (×3632) to confirm
 - click global button to open summary page and determine cause, for example:



CRYOALARMS.GRF

2:56:17 PM
7/31/01

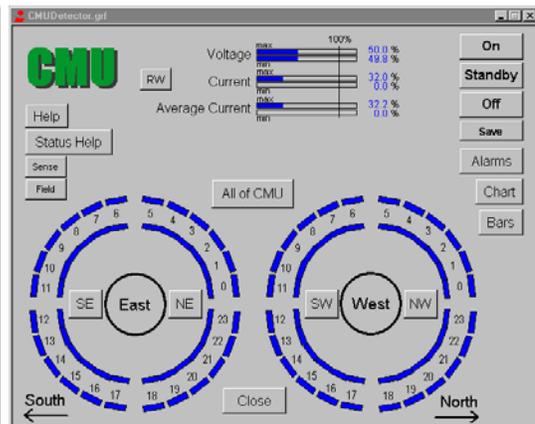
 **CRYO ALARMS** SUMMARY CRYO MENU

DEVICE	DESCRIPTION	LO LIMIT	CURRENT VALUE	HI LIMIT	Audible Alarm
<u>COMPRESSOR</u>					
PCPDIS	Discharge of Purifier Skid	200.0	279.9 psig	320.0	
PCPSUC	Compressor Suction Pressure	0.25	1.00 psig	10.00	
CMP-CON	Compressor On Status		OK		
<u>DEWARS</u>					
FLEADA	Flow Rate Lead A Run Mode	0.40	0.50 g/s		
FLEADB	Flow Rate Lead B Run Mode	0.40	0.50 g/s		
LLCDEW	Control Dewar Superconducting LL	32.0	56.16 %		
LLDEW	LHe Storage Dewar Level	23.0	56.04 %		
VWCAN-MKS	Watt Can MKS		0.001 torr	0.007	
FIMF	Helium Flow Into Magnet	12.0	21.96 g/s		
<u>MAGNET</u>					
RBOCNT-C	Coil Bobbin Center Temp		4.6 F	13.00	
<u>VACUUMS</u>					
VCDEW	Control Dewar Vacuum Pirani		0.00 torr	0.019	
<u>ADSORBER</u>					
LL-ADSB	Adsorber N2 Level	50.0	80.11 %		
<u>REFRIGERATOR</u>					
WE-XS-ON	Wet Engine Status		Engine ON	OK	
NDE-XS-ON	North Dry Engine Status		Engine ON	OK	
EDE-XS-ON	East Dry Engine Status		Engine OFF	OK	

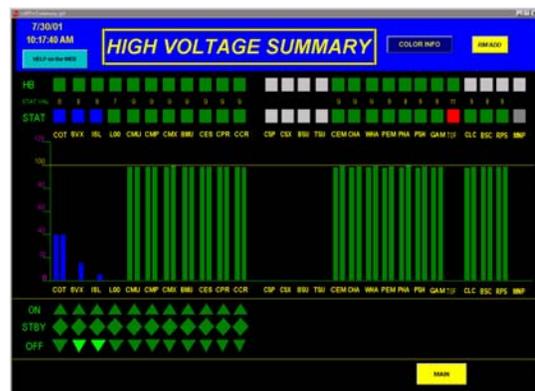
MCS: Basic *iFIX* Operation

(continued)

- as an example, if the CMU trips:
 - go to *GLOBAL ALARMS* and click *CMU* to bring up alarm history (record in e-log)
 - from the *D* button, open CMU HV control GUI to reset specific channels



- HV trips can also be reset from *HV SUMMARY* by clicking the *ON* arrow
- *HV SUMMARY* should be used to place detectors on standby for “flying wires” (for COT, SIL, and CMP)



MCS: Shift Responsibilities

- write list of all silenced alarms or other exceptions in e-log at the beginning of shift
- continually monitor VESDA, FIRUS, and LED status board in the control room for alarms or trouble (refer to “Monitoring Ace Knowledge”)
- beginning/end of store, “flying wires”:
 - use “HV Summary” to turn ON/OFF/STBY detectors
- detector HV trips:
 - use “Global Alarms” to determine source
 - consult MCS Web Page for specific instructions
 - use “HV Summary” to reset or page expert
- lost heartbeat (purple):
 - notify system experts
- Process System Alarms:
 - click on system button to determine cause
 - check with cryo techs for instructions
- *iFIX* logged out or “unavailable”:
 - click on Start/Programs/*iFIX*/Login
 - logout of *ACE* account, log back in
- *iFIX* crashes: (page Ops Manager and experts)
 - J.C. Yun, 722-7589
 - John Yoh, 840-4774